



DOCTORAL DEGREE SCHOLARSHIPS FOR AEROSPACE RESEARCH

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In promoting doctoral studies, your company benefits from direct access to innovation and talent.

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MUNICH AEROSPACE: THE ENGINE FOR AN ATTRACTIVE RESEARCH LOCATION

DOCTORAL SCHOLARSHIPS: CONNECTING INDUSTRY WITH SCIENCE

Munich Aerospace doctoral scholarships give companies access to one of the world's most innovative aerospace research landscapes. Munich Aerospace directs the doctoral scholarships you fund to qualifying young scientists, ensures smooth administrative processes and provides scientific support to candidates through one of our four partners: Technical University of Munich, University of the German Armed Forces Munich, German Aerospace Center and Bauhaus Luftfahrt.



Most of the doctoral students play an active part in a Munich Aerospace Research Group. The focus areas of these research groups are: *Aerospace Communications and Navigation, Autonomous Flight, Aviation Management, Cyber & Public Security, Earth Observation, Green Aerospace, Safety in Orbit* and *Urban Air Mobility*. The current research groups are listed in the insert to this brochure.

These inter-institutional research groups are directed by professors or qualified up-and-coming scientists associated with our partners. If your organisation funds multiple scholarships, a new research group can be formed in cooperation with our scientific partners.

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Funding Munich Aerospace scholarships gives companies access to an excellent aerospace research network, creating a win-win situation for all parties.

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Prof. Dr.-Ing. Günter W. Hein,
Munich Aerospace Executive Board member and Emeritus of
Excellence of the University of the German Armed Forces Munich



**MUNICH AEROSPACE:
THE NEXUS OF BUSINESS AND RESEARCH**

Munich Aerospace was formed in 2010 by Technical University of Munich, University of the German Armed Forces Munich, German Aerospace Center and Bauhaus Luftfahrt as an organisation linking research, teaching, business and public policy, bundling regional competencies. We identify new research objectives and define research focuses so as to exploit synergies.

FUNDING SCHOLARSHIPS OPENS DOORS TO RESEARCH



BRIGHT MINDS FOR COMPETITIVE ADVANTAGE

Innovation requires high-powered research. By funding doctoral scholarships you can secure a strong position in the competition for the best scientific talent, gain the benefit of know-how derived from dissertation projects and get access to an organised research network of potential partners and staff.



ADMINISTRATION WITHOUT BUREAUCRACY

As funding provider, you are the driving force behind research topics relevant to your company's innovation work and market position. Munich Aerospace assists you in dealings with scholarship holders, taking administrative work off your hands. We handle calls for scholarship applications and will, on request, gladly assist in the candidate selection process. We also take over a range of human resources tasks, providing intensive support to scholarship holders.



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Munich Aerospace scholarships help us cultivate contacts with outstanding young scientists and interface with key research institutions to make advances in the areas of importance to us.

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Hans J. Steininger, CEO, MT Aerospace AG



SCHOLARSHIPS FOR HIGH-LEVEL RESEARCH

INTENSIVE SUPPORT AND INTERDISCIPLINARY DIALOGUE

Munich Aerospace scholarship holders are able to fully concentrate on their doctoral work, enabling them to complete their academic projects within a shorter period of time. Access to a broad range of top-quality research infrastructures creates optimal conditions for successful outcomes. The extensive support provided typically involves annual discussion meetings and integration into one of our topically relevant research groups.

We are furthermore dedicated to expanding the horizons of doctoral students, who become members of either the Graduate School of Technical University of Munich or that of the German Aerospace Center benefiting from ongoing interdisciplinary scientific dialogue and professional networking opportunities. Retreats are held, for example, at which leading international scientists, prominent speakers from the business sector and doctoral students themselves present on research topics.



SCHOLARSHIP KEY DATA:

SCHOLARSHIP PERIOD: 2 – 3 YEARS

COST FOR SPONSOR COMPANIES:

25,000 EUROS EUROS/YEAR

(tax-deductible donation)

DISBURSEMENT TO SCHOLARSHIP HOLDERS:

Scholarship stipend: 1,575 EUROS / MONTH

Supplements for conference travel, research-relevant equipment, rental costs and travel allowance (optional):

6,100 EUROS EUROS/YEAR





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The Munich Aerospace industrial scholarship made it possible to conduct application-oriented research without having to spend time with project work distracting me from my doctoral pursuits.

Dr.-Ing. Jens Trümner,
former holder of a Munich Aerospace scholarship
at MTU Aero Engines AG

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CONTACT FOR CORPORATE INQUIRIES:

Munich Aerospace

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Possible topics for Munich Aerospace industrial scholarships:

AEROSPACE COMMUNICATIONS AND NAVIGATION

- ▶ Seamless GNSS Satellite Navigation in Outer Space and on Other Planets (Moon, Mars)
- ▶ Protection of GNSS Against Interference, Jamming, Spoofing
- ▶ Use of Planned Mega-Constellations in Communications for Navigation
- ▶ Error Control Coding for Ultra-Reliable Low-Latency Communications

GREEN AEROSPACE

- ▶ Parameterisation of Digital Models
- ▶ Flexible Manufacturing and Process Chains
- ▶ Eco-efficient Aircraft
- ▶ Environmentally Compatible Urban Flights
- ▶ Hybrid Electric Aircraft

CYBER & PUBLIC SECURITY

- ▶ Protection of Critical Infrastructure Using GNSS
- ▶ Security Issues in GNSS Receivers
- ▶ Detection, Identification and Localization of GNSS Interferences
- ▶ Public Key Cryptosystems for the Quantum Computer Age (Post Quantum Cryptographic Algorithms)
- ▶ Robust and Secure Protocols for Quantum Key Cryptosystems

GEODETIC EARTH OBSERVATION

- ▶ Use of AI and Machine Learning to Derive Geoinformation of the Earth's Surface from Satellite Image Data
- ▶ Big Geospatial Data Management and Analytics for Geoscientific Science
- ▶ Knowledge Discovery and Visual Analytics in Big Earth Observation Data
- ▶ Support of Autonomous Driving with Image Data from Airborne Sensors/Platforms
- ▶ Conception, Design and Scientific Application of Airborne Remote Sensing Systems

AVIATION MANAGEMENT

- ▶ Urban Air Mobility
- ▶ Future Prospects of Decentralised Aviation
- ▶ Long-term Developments of the Aviation System
- ▶ New Business Models in Aviation

AUTONOMOUS FLIGHT

- ▶ Real-time Trajectory Optimisation during Nominal Operations and Failure Cases
- ▶ Fault Tolerant and Adaptive Flight Controls
- ▶ Autonomous Concepts for Personal Air Vehicle (PAV) Operations
- ▶ Enhancing Autonomy Relevant Technologies, like Sense and Avoid Capabilities

SAFETY IN ORBIT

- ▶ Securing the Satellite Uplink by Detecting, Mitigating and Localising Ground Based Interference from Space
- ▶ Ensuring Range Safety of Launchers and Satellites with Multi-Constellation GNSS
- ▶ Space Traffic Management

Companies have the opportunity
to partake in the following
Munich Aerospace Research Groups:

AEROSPACE COMMUNICATIONS AND NAVIGATION

Research Group

ON-BOARD DIGITAL PREDISTORTION FOR NEXT-GENERATION HIGH THROUGHPUT SATELLITES

Head: Prof. Andreas Knopp (UniBw)
Stakeholders: UniBw, DLR

Research Group

EFFICIENT CODING AND MODULATION FOR SATELLITE LINKS WITH SEVERE DELAY CONSTRAINTS

Head: Prof. Gerhard Kramer (TUM)
Stakeholders: TUM, DLR

AUTONOMOUS FLIGHT

Research Group

CERTIFIABLE AUTONOMY IN UNMANNED AERIAL VEHICLES

Head: Dr. Gunther Reißig (UniBw)
Stakeholders: UniBw, TUM

Research Group

RE-ENTRY OPTIMISATION TO MINIMISE HEATING OR INFRARED SIGNATURE

Head: Prof. Christian Mundt (UniBw)
Stakeholders: UniBw, TUM, DLR

AVIATION MANAGEMENT

Research Group

ECO-EFFICIENT AIRPORT – FRAMEWORK AND DEVELOPMENT PERSPECTIVES FOR ECOLOGICALLY AND ECONOMICALLY SUSTAINABLE AIR TRAFFIC

Head: Dr. Kay Plötner (BHL)
Stakeholders: BHL, TUM, UniBw

EARTH OBSERVATION

Research Group

FUSION OF REMOTE SENSING AND SOCIAL MEDIA DATA

Head: Prof. Xiaoxiang Zhu (DLR)
Stakeholders: DLR, TUM

SAFETY IN ORBIT

Research Group

PROPULSION TECHNOLOGIES FOR GREEN IN-ORBIT SPACECRAFTS

Head: Prof. Oskar J. Haidn (TUM)
Stakeholders: TUM, UniBw

URBAN AIR MOBILITY

Research Group

MODELLING, SIMULATION AND CONCEPTS OF URBAN AIR MOBILITY TRANSPORT SYSTEMS

Head: Dr. Kay Plötner (BHL)
Stakeholders: BHL, TUM, UniBw